In generating offset value signal OV_s, compensation parameter determination module 480 includes an offset curve 482 ("OSC 482") that includes offset values OV1-OV5 included within OSD 372, and relative velocities RV1-RV5 that are identical to the relative velocities RV1-RV5 listed in SFC 471a-471c and OSC 472a-472c (FIG. 8A). Compensation parameter determination module 480 utilizes OSC 482 in implementing an offset value determination method in accordance with the present invention. FIG. 9C illustrates a flowchart 780 that is representative of the offset value determination method.

During a stage S782 of flowchart 780, compensation parameter determination module 480 determines if relative velocity signal RV_s is less than a relative velocity RV1 as listed in OSC 482. If so, during a stage S784 of flowchart 780, compensation parameter determination module 480 generates offset value signal OV_s equating an offset value OV1 as listed in OSC 482.

Otherwise, during a stage S786 of flowchart 780, compensation parameter determination module 480 determines if relative velocity signal RV_s is less than a relative velocity RV2 as listed in OSC 482. If so, during a stage S788 of flowchart 780, compensation parameter determination module 480 generates offset value signal OV_s equating a computation of an interpolation equation illustrated in stage S788, which is a function of offset value OV1, an offset value OV2, relative velocity RV1, and relative velocity RVS as listed in OSC 482.

Otherwise, during a stage S790 of flowchart 780, compensation parameter determination module 480 determines if relative velocity signal RV_s is less than a relative velocity RV3 as listed in OSC 482. If so, during a stage S792 of flowchart 780, compensation parameter determination module 480 generates offset value signal OV_s equating a computation of an interpolation equation illustrated in stage S792, which is a function of offset value OV2, an offset value OV3, relative velocity RV2 and relative velocity RV3 as listed in OSC 482.

Otherwise, during a stage S794 of flowchart 780, compensation parameter determination module 480 determines if relative velocity signal RV_S is less than a relative velocity RV4 as listed in OSC 482. If so, during a stage S796 of flowchart 780, compensation parameter determination module 480 generates offset value signal OV_S equating a computation of an interpolation equation illustrated in stage S796, which is a function of offset value OV3, an offset value OV4, relative velocity RV3, and relative velocity RV4 as listed in OSC 482.

Otherwise, during a stage S798 of flowchart 780, compensation parameter determination module 480 determines if relative velocity signal RV_S is less than a relative velocity RV5 as listed in OSC 482. If so, during a stage S800 of flowchart 780, compensation parameter determination module 480 generates offset value signal OV_S equating a computation of an interpolation equation illustrated in stage S800, which is a function of offset value OV4, an offset value OV5, relative velocity RV4 and relative velocity RV5 as listed in OSC 482.

Otherwise, during a stage S802 of flowchart 780, compensation parameter determination module 480 generates offset value signal OV_S equating offset value OV5 as listed in OSC 482.

Referring to FIGS. 6B, 8B, 9B and 9C, those having ordinary skill in the art will appreciate that the sets of operations depicted in flowcharts 260, 570, 680 and 780, respectively, each represents one of many possible methods for implementing a mathematical relationship between the associated input and output parameters. In the illustrated embodiments, flowcharts 260, 570, 680 and 780 each depict table look-up operations with a plurality of points, with interpolation used between points and saturation used at the extremes. In alternative embodiments of flowcharts 260, 570, 680 and 780, the look-up table operations may include extrapolation beyond the look-up table end-points in lieu of saturation and/or direct selection of look-up table points between table points in lieu of linear interpolation. Furthermore, the number of points illustrated in the look-up tables of FIGS. 6A, 8A and 9A can be increased or decreased based on the desired look-up table resolution and any existing implementation limitations (e.g., size of computer memory). In addition to

the look-up table embodiments described herein, many other alternative embodiments also exist, such as, for example, implementation of a polynomial equation relating the output parameter to the input parameter.

Those having ordinary skill in the art will appreciate various advantages of the present invention for the preceding description herein of FIGS. 2-9C. One important advantage is a nearly ideal temperature compensation within the limits of a damper performance envelope of MR damper 10 (FIG. 1). Specifically, current command module 40 (FIG. 2) generates operating current I_{OS1} (FIG. 2) which has a known correlation to a damping force of MR damper 10 at a measured velocity of MR damper 10, and a baseline temperature. The various temperature- and relative velocity-dependent offset and scale factor curves described in connection with FIGS. 6A, 8A, and 9A are accordingly developed to optimize a temperature compensation to generate operating current I_{OS2} (FIG. 2) that allows MR damper 10 to produce the damping force at a measured velocity in view of the existing operating temperature of MR damper 10.

The present invention has been described herein in the context of controlling a MR damper. The present invention, however, can be employed to control other controllable dampers as would occur to those having ordinary skill in the art, such as, for example, controllable dampers using one or more electro-mechanical valve(s). Additionally, the present invention can be employed in other devices using MR fluid or the like as would occur to those having ordinary skill in the art, such as, for example, fan clutches and engine mounts.

While the embodiments of the present invention disclosed herein are presently considered to be preferred, various changes and modifications can be made without departing from the spirit and scope of the invention. The scope of the invention is indicated in the appended claims, and all changes that come within the meaning and range of equivalents are intended to be embraced therein.